FEDERATION OF CANADIAN MUNICIPALITIES

THE MACROECONOMIC IMPACT OF ACCELERATED SPENDING ON MUNICIPAL INFRASTRUCTURE

Prepared for the FCM by Informetrica, Ltd

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Authors

Carl Sonnen
Mark Haney

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THE FEDERATION OF CANADIAN MUNICIPALITIES

Whether urban or rural, small or large, municipalities throughout Canada have much in common. Shared interests range from national policies and programs in areas like housing, taxation and transportation to day-to-day local management and service delivery concerns. These items demand innovation and fresh new approaches. The Federation is Canada's municipal pipeline of communication, transferring ideas, information and new techniques to communities across the nation through its publications, meetings and conferences.

At the same time, the Federation is the national voice for municipal interests in Canada. The FCM works to enhance the position of local government in the Canadian constitutional system by building bridges of communication with national political leaders so they can better appreciate the needs, hopes and aspirations of the municipal world.

The Federation's message is that Canadian towns and cities be recognized as a major source of economic strength, capable of governing in partnership with the provinces and the federal government. By emphasizing the pragmatic and flexible approach of local governments, FCM strives toward a new framework of policy development in a changing Canada.

FCM offers two main types of membership: municipal and affiliate. The former includes 273 municipalities of every size in every corner of Canada; the latter, the major provincial and territorial municipal associations. Through these, as well as its regional committees and issue-oriented task forces, FCM conveys the municipal perspective to decision-makers in the national capital.

The Federation of Canadian Municipalities
1318 - 112 Kent Street
Ottawa, Ontario K1P 5P2
(613) 237-5221

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As with the Federation's earlier report, Municipal Infrastructure in Canada: Physical Condition and Funding Adequacy ("Municipal Dimensions", volume 4, number 1; January, 1985), this study of the macroeconomic impact of accelerated spending on municipal infrastructure required a cooperative multi-sector effort.

Drafts of the report were reviewed by Cliff Simpson, Budget Director for the City of Ottawa; E.J. Howring, C. Eng., Engineering Department, City of Toronto; Bill Nevins, Chief Economist for the Canadian Construction Association; Larry Katz, Senior Research Officer of the Canadian Union of Public Employees and Tim Catherwood, Administrative Assistant to the President of the Canadian Federation of Labour. Each provided comments that were useful in preparing the report. While the findings contained in the final report do not necessarily reflect the views of the organizations these individuals represent, it should be noted that all share with the Federation a growing concern for the state of Canada's municipal infrastructure.

Funding for this study was provided by the Federation's Resource Centre for Municipal Development Activities. The purpose of the Centre is to undertake and disseminate research related to municipal economic development, including relevant federal and provincial programs and policies. Through its Industrial and Regional Development Program, the federal Department of Regional Industrial Expansion contributes funds to assist the Centre in its work.

Doreen Lawson

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The Macroeconomic Impact of Accelerated Spending on Municipal Infrastructure

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EXECUTIVE SUMMARY

The health and well-being of Canadians depends on basic services like roads, sewers, water supply networks, schools and transit systems. Collectively known as "infrastructure", these systems are also essential to the vitality of Canada's economy. In recent years, circumstances have combined to create problems for municipal infrastructure:

- pressure on budgets during recession
- some post-war infrastructure now nearing end of lifespan
- rapid inflation of 1970's unmatched by corresponding tax increases
- reluctance to borrow at high interest rates
- reduction in federal and provincial funding

In recognition of this situation, the Federation of Canadian Municipalities created a Task Force on Municipal Infrastructure in June, 1983, to assess the magnitude of the problem and to develop strategies to deal with it.

A Technical Committee comprising senior appointed municipal officials and faculty of the University of Toronto's Department of Civil Engineering carried out a survey and analysis of the state of urban infrastructure. This was submitted to the Task Force and to the FCM in June, 1984. On the basis of their findings, the Federation issued Municipal Infrastructure in Canada: Physical Condition and Funding Adequacy as volume 4, number 1 of its "Municipal Dimensions" series in January, 1985.

That study demonstrated that there is a significant municipal infrastructure problem in Canada. Such essential facilities as roads, bridges, sidewalks, water mains and sewers are in poorest condition and are deteriorating rather than improving.

With respect to funding adequacy, the study estimated that $12 billion over and above what municipalities will spend on infrastructure in the next five to ten years is needed to bring the most seriously deteriorated infrastructure to acceptable levels.

The study also noted that the opportunity exists to reconstruct municipal infrastructure and to

strengthen Canada's economic recovery while, at the same time, employing large numbers of Canadians in these labour intensive works.

To determine the direct, indirect and induced effects on the economy of investing $12 billion in infrastructure, the FCM commissioned Informetrica Limited to undertake this study, The Macroeconomic Impact of Accelerated Spending on Municipal Infrastructure.

The Informetrica Study

The Informetrica Study assesses the "macroeconomic" consequences for the national economy of the $12 billion expenditure in terms of:

- the impact on the output of industries, and expenditures of households, businesses and governments;
- the consequent impact on employment;
- the effect on inflation;
- the impact on incomes of governments, households and others.

For the purposes of the study, it was assumed that the $12 billion spending program would occur evenly over a five-year period beginning in 1986, and that each of the three orders of government would contribute equally to the cost of the program. Allowing for an anticipated average inflation rate of 4.2 percent annually, the nominal expenditure would total $14 billion, or roughly one-half of one percent of the GNP per year.

It was further assumed that this reconstruction program represents a major additional program equivalent to more than 45% of the expenditures municipalities would allocate to capital formation in any case. Varying municipal circumstances result in different views of the extent of infrastructure deterioration and of the priority that should be accorded different aspects of infrastructure. In keeping with the findings of the January, 1985 study, this report assumes that approximately one-half the expenditures are allocated to repairing roads and bridges. The remaining half is split about evenly between sewer and water systems.

In calculating the impact of this investment on expenditures, output, employment, inflation and incomes,

two cases were considered. In the High Impact Case, it was assumed that all three orders of government borrow the required funds completely. It was also assumed that the funds are obtained from abroad (or equivalently, that other capital requirements are provided from foreign sources), with no significant effect on Canadian interest rates.

In the Low Impact Case, it was assumed that local governments impose taxes and increase user fees to pay partly for their share of the increased spending. It was also assumed that borrowing by municipalities and the other orders of government has an adverse effect on capital markets in the form of increasing interest rates generally.

In each case, the backdrop against which economic impacts are measured is the "Base Case" economy developed from Informetrica's most recent analysis and forecast of Canadian economic conditions (December, 1984).

Impacts on the Economy

THE STUDY CONCLUDES THERE WOULD BE A POSITIVE IMPACT ON ECONOMIC OUTPUT, EMPLOYMENT AND INCOMES IN EACH YEAR OF THE SPENDING PROGRAM.

The magnitude of these effects would vary, depending on how the program is funded. If municipalities fund their share through increased taxes and user fees, and if increased borrowing by the federal and provincial governments leads to "crowding out" in capital markets, causing increased interest rates (the Low Impact Case), then real economic activity will be increased by about 0.5 percent in each year from 1986 through 1990, or by about the amount of the spending program.

Alternatively, if the program is funded completely by debt, and there are no adverse impacts on interest rates (the High Impact Case), real economic activity will be increased by about 0.7 percent each year.

THESE RESULTS SUGGEST THAT 222,000 TO 285,000 PERSON-YEARS OF ADDITIONAL EMPLOYMENT WOULD BE CREATED BY THE PROGRAM.

Again, the level of increased employment would depend on the funding arrangements and impacts of the spending on interest rates. In the High Impact Case, the employment additions grow from 30,000 in 1986 to more than 75,000 in 1990. In the Low Impact Case, employment is increased by a little less than 30,000 in the first year, rising to about 55,000 in the last. In either case, construction and manufacturing employment would constitute from 55 to 70 percent of the increase.

Since the direct expenditures for municipal infrastructure are principally for equipment and construction labour, the main industrial benefits -- more than 55 percent of the total change in economic output -- would accrue to the construction and manufacturing sectors, although all other sectors could be expected to record some positive effects as well.

In addition, the industries that supply the labour, equipment and materials required to fulfil the municipal expenditures and to meet increased personal consumption can be expected to increase their own investment to provide the enlarged facilities they would need.

IN TERMS OF IMPORTS, ONLY ABOUT TEN PERCENT OF THE EQUIPMENT AND MATERIALS REQUIRED TO SATISFY THE NEEDS OF THE MUNICIPAL SPENDING WOULD BE EITHER DIRECTLY OR INDIRECTLY SUPPLIED FROM OFFSHORE.

The positive effects on the components of GNP are generalized for most years. Government capital expenditures are increased because they include the increased municipal expenditures. Personal incomes will be increased in the form of enlarged wages and distributed profits resulting from the municipal spending. Some of this additional income would likely be saved, but one-half or more would find its way into consumer spending. If municipalities derive their funds from user fees and increased taxes, additional consumer spending is smaller since real income improvement is limited, but the differences are slight.

THE RESULTING LARGER ECONOMY WOULD INCREASE GOVERNMENT REVENUES AND REDUCE SOME EXPENDITURES, PERMITTING GOVERNMENTS TO RECOVER SOME OF THE INITIAL SPENDING.

Nevertheless, there would be a negative effect of about $6 billion (at nominal prices) on the balances of the three orders of government combined. In the event that each order of government funds its share of the program through debt, and there is no adverse effect on interest rates, the anticipated effects on federal and provincial balances would be positive, or only slightly negative. By contrast, the deterioration in municipal balances would average more than $1 billion annually.

If municipalities fund most of their spending share through increased taxes and user fees, their balances would be positively affected but the general economic benefits of the program would be weakened. If, at the same time, higher interest rates were also to occur, there would be a deterioration in the balances of the federal and provincial governments as well.

FINALLY, IN COMPARING EXPENDITURES ON MUNICIPAL INFRASTRUCTURE TO OTHER POSSIBLE GOVERNMENT EXPENDITURES, THE STUDY CONCLUDES THAT ONLY POLICIES THAT DIRECTLY REDUCE CANADIAN PRICES WOULD HAVE A CLEAR, COMPARATIVE ADVANTAGE IN TERMS OF EMPLOYMENT AND GOVERNMENT DEFICITS OVER A PROGRAM OF INCREASED CAPITAL EXPENDITURES.

Future Directions

In the view of the Federation, this study clearly demonstrates the benefits of government investment in municipal infrastructure in terms of impact on output and expenditures, employment, incomes, export leakage and in relation to other possible expenditures.

These will be discussed in upcoming meetings with federal and provincial officials. There remain, however, a number of areas for which more precise data would be useful.

- an assessment of who will benefit from the jobs created in terms of income groups, skills, age and sex;
- an analysis of later savings that might accrue from current investment -- or, put another way, of the costs that might accrue from further delaying municipal infrastructure;
- what innovative alternatives to those assumed for the purposes of this study are available to finance municipal infrastructure.

The Federation proposes to investigate these issues in the near future.

1 INTRODUCTION TO THE INFORMETRICA REPORT

For several years, Canadian municipalities have judged that investment to maintain and complete needed water and sewage treatment facilities, highways, bridges, and other physical infrastructure has been insufficient, and that the resulting deterioration of existing systems is rendering them inadequate to meet the demands of population and economic activity. Accordingly, a Task Force on Municipal Infrastructure was established in June, 1983, by the Federation of Canadian Municipalities to determine the extent of the gap between maintenance needs and expenditures, and to develop policies to ameliorate the situation. A survey of the physical condition of municipal infrastructure and funding adequacy was sponsored by the Federation of Canadian Municipalities, and the findings reported in Municipal Infrastructure in Canada: Physical Condition and Funding Adequacy, dated January, 1985.

Although the report reflects differences in definition, uncertainties about the state of existing facilities and varying opinions about priorities that are a function of varying circumstances in individual municipalities as well as a notable shortage of reporting from smaller municipalities, it nevertheless, indicates that spending of about $12 billion is needed to upgrade facilities from their current state to "acceptable standards".

The following study assesses the implications for the national economy of spending this additional $12 billion. More particularly, this reports on the "macroeconomic" consequences of such spending, includes data on:

* the impact on the output of industries, and expenditures of households, businesses, and governments;
* the consequent impact on employment;
* the effect on inflation; and
* the impact on incomes of governments, households, and others.

The impact measures reported include the direct effects - measured as the employment and materials used directly to construct, reconstruct, or repair highways, waste treatment facilities, etc. - and the indirect and induced effects - those traceable to linkages between industries and to the spending of the wages and profits received by the direct beneficiaries of the program.

At the outset, it is important to understand that the size of the spending effect on the economy depends on the size of the spending program, on the kind of infrastructure that is to be built or repaired, and on how the spending is to be paid for. In determining the size and nature of the spending, we have relied on the expertise of the engineers and municipal officials as reported in FCM's January, 1985, report.

As to program funding, we have concluded that while there is no best view of how this will be provided, the size of the program's impact on the economy will vary with the nature of the funding. If funds are diverted from other uses (e.g., from municipal employment or from local households in the form of increased taxes), then much of the direct, positive effects on output and employment will be offset.

On the other hand, if the program is paid for by borrowing, and federal monetary authorities accommodate this additional borrowing by increasing the supply of money, there will be few offsets, and the impact on the economy will be much larger. If those authorities do not accommodate the spending, it can be argued that the additional expenditures would "crowd out" others from capital markets, causing a rise in interest rates. In this event, investment by business would be curtailed as would household expenditures on housing and some consumer goods. In turn, this would constitute an offset to the direct, positive effects of the municipalities' spending. Given our uncertainty about funding, we have developed two impact cases that provide reasonable upper and lower bounds to the size of the positive effects on the economy. We have labelled these the High and Low Impact cases.

2 SIZE AND DETAILS OF THE CAPITAL PROGRAM

2.1 Spending Details

Table 1, below, details our assumptions about the nature of the additional spending required to bring the infrastructure back to "acceptable levels". At 1984 prices, the spending is assumed to amount to $12 billion, which expenditures for the purposes of this study, are spread evenly over five years at $2.4 billion per annum, beginning in 1986. Allowing for inflation, which, as measured by the Consumer Price Index, we project will average 4.2 per cent annually in 1985-90, the expenditure would total more than $14 billion. In 1971 prices, which is the unit of measurement required for our formal analysis, annual expenditures total almost $3.7 billion.

As we noted, varying circumstances result in different views of the extent of the gap that exists what elements of the deficiencies should be corrected first. The mix of expenditures used for this study (displayed in Table 1) represents a rough consensus implied by the January, 1985 study. Approximately one-half of the expenditures are allocated to repair of roads and bridges. The remaining half is split about evenly between expenditures on sewage and water systems.

Table 1

Additional Spending by Category
(billions of dollars)

	1986	1987	1988	1989	1990	TOTAL
Total						
($, nominal)	2.62	2.72	2.82	2.92	3.05	14.14
($, 1984)	2.40	2.40	2.40	2.40	2.40	12.00
($, 1971)	.74	.74	.74	.74	.74	3.69
Roads						
($, nominal)	1.06	1.11	1.15	1.20	1.26	5.78
($, 1984)	.97	.97	.97	.97	.97	4.83
($, 1971)	.29	.29	.29	.29	.29	1.44
Bridges						
($, nominal)	.25	.26	.27	.28	.30	1.36
($, 1984)	.23	.23	.23	.23	.23	1.14
($, 1971)	.07	.07	.07	.07	.07	.34
Sewage Collection						
($, nominal)	.41	.42	.44	.45	.47	2.19
($, 1984	.38	.38	.38	.38	.38	1.89
($, 1971)	.12	.12	.12	.12	.12	.60
Sewage Treatment						
($, nominal)	.29	.3	.31	.32	.34	1.57
($, 1984)	.27	.27	.27	.27	.27	1.36
($, 1971)	.09	.09	.09	.09	.09	.43
Water Distribution						
($, nominal)	.34	.35	.37	.38	.39	1.84
($, 1984)	.32	.32	.32	.32	.32	1.58
($, 1971)	.1	.1	.1	.1	.1	.5
Water Treatment						
($, nominal)	.26	.27	.28	.29	.30	1.39
($, 1984)	.24	.24	.24	.24	.24	1.2
($, 1981)	.08	.08	.08	.08	.08	.38

Note: Sums may not add because of rounding

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2.2 Funding

The spending we have assumed as necessary to close the gap represents a major additional program. The amounts are equivalent to more than 45 per cent of the expenditures we anticipate will be allocated by municipalities in any event for capital formation in 1986-90. In both impact cases, we have assumed that funding support is provided equally (i.e., one-third each) by the federal, provincial, and municipal governments.

In the High Impact Case, we assume that all three governments borrow the required funds completely. Further, this case assumes that the funds are acquired from abroad, or, equivalently, that other capital requirements are provided by foreign capital sources, with no significant effect on Canadian interest rates.

In the Low Impact Case, we assume that local governments will impose taxes and increase user fees to pay partly for their share of the increased spending. For this analysis, we have assumed that property taxes are increased. Additionally, we assume that borrowing by municipalities and the other orders of government has an adverse effect on capital markets in the form of increasing interest rates generally.1/ Table 2, below, details our assumptions about municipal funding of each of the six spending components.

Given this breakdown, and the one-third split between each of the three levels of government, Table 3 details the assumed funding patterns by year, and the direct impact of the debt funding on Canadian interest rates.

1/ The assumed breakdown of municipal funding used in this case is based on information drawn from recent patterns. This might be altered, however, if there were a large increment to spending as is assumed for this study. In that event, it is likely that borrowing, as in the High Impact Case, would account for a larger share of the municipal funding.

Table 2

Low Impact Case
Municipal Funding by Spending Category
(as per cent of category total)

	per cent
Roads	
Taxation	90.19
User Fees	3.91
Debt	5.9
Bridges	
Taxation	75.49
User Fees	0.
Debt	24.51
Sewage Collection	
Taxation	39.26
User Fees	49.73
Debt	11.01
Sewage Treatment	
Taxation	30.13
User Fees	66.88
Debt	2.99
Water Distribution	
Taxation	6.26
User Fees	66.88
Debt	7.32
Water Treatment	
Taxation	6.86
User Fees	82.38
Debt	10.76

Table 3

Low Impact Case
Funding by Level of Government
and Source
(billions of dollars)

	1986	1987	1988	1989	1990	TOTAL
Federal						
Debt	.87	.91	.94	.97	1.01	4.71
Provincial						
Debt	.87	.91	.94	.97	1.01	4.71
Municipal						
Taxation	.48	.5	.52	.54	.56	2.62
User Fees	.33	.34	.36	.37	.39	1.79
Debt	.06	.07	.07	.07	.06	.30
Increase in interest rate 1/	.27	.32	.37	.43	.51	

1/ 90-day commercial paper rate

3 METHOD OF ANALYSIS

3.1 Research Approach

To measure the impacts of this spending, we have employed an econometric model of the Canadian economy. This model - The Informetrica Model - has several attributes that are important to the analysis.2/

* Demands on the economy are detailed for about 400 separate categories of consumption, business investment, foreign trade, and government spending. The government spending includes categories of capital spending for highways, schools, buildings, and other construction. Accordingly, we are able to closely approximate, in the model, the direct demands placed on the economy by the six spending categories outlined in the previous section. Further, it is widely observed that the response to changed incomes, output, and prices of consumers, investors, and those engaged in foreign

2/ A description of The Informetrica Model is available to subscribers of Informetrica's National Forecast Service.

trade varies considerably from category to category. The demand detail available in the model captures these varying responses.

* Output is measured for about 80 industries, and is linked to the demands on the economy with so-called "input-output" tables that assess relations among producing industries. Thus, indirect effects on mines, steel mills, and the transportation industries of direct purchases of equipment for water and sewage treatment are captured by the model.

* The model includes measures of prices for all demand and output categories, and calculates these, and the demands and outputs of the economy simultaneously. Thus, the full set of interrelations that exist in the economy are assessed.

* Labour productivity is determined for more than 30 industries and, with detailed estimates of wage and property income, provides the basis for differentiating by industry the effects of government spending on unit labour costs and, therefore, prices. Thus induced expenditures of consumers and investors reflect the varying effects of the program on prices, as well as the spending of wages and profits that were directly increased by the government.

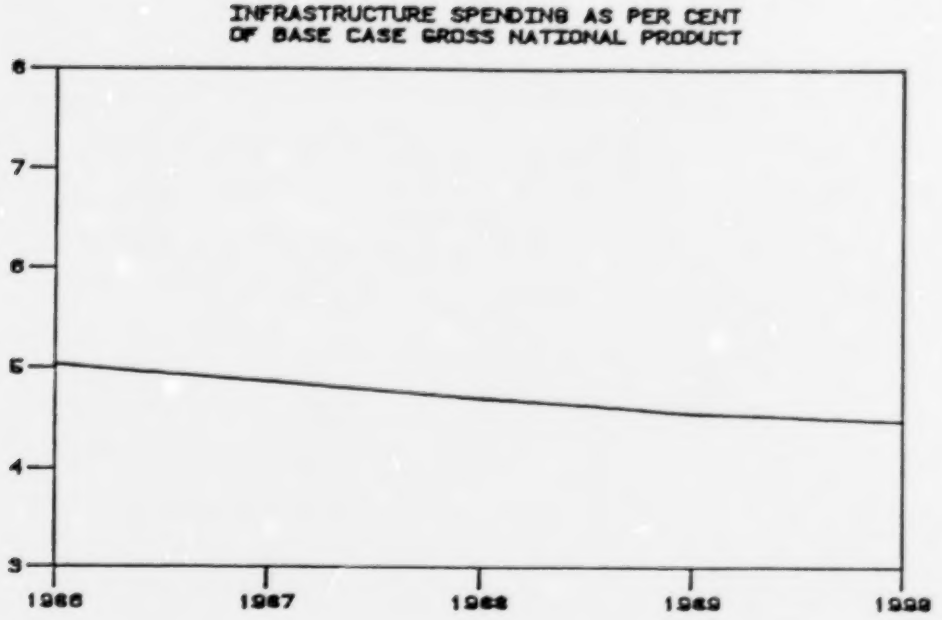
* The equations of the model have "dynamic" properties. Accordingly, changes to the economy are sensitive to changes in previous years as well.

* The model has "non-linear" properties. Accordingly, results are sensitive to the size of the government spending program.

Given this model framework, the economy is first projected for 1985-90, assuming "normal" government expenditure policies, a projection for economic activity in the United States and elsewhere, and other conditions. Informetrica Limited operates a service to regularly project Canadian economic conditions, and has chosen its most recent outlook as the Base Case economy for this study.3/ The economy is then projected assuming that the $12 billion incremental spending program displayed in Figure 1 occurs. Comparison between this second Impact Case and the Base Case measures the impact of the program on the economy.

3/ Informetrica Limited, Assumptions and Summary: Post- Workshop II-84 Forecast, (December, 1984. Ottawa).

Figure 1



3.2 Base Case Economy

Table 4, below, provides an overview of the Base Case economy used for this study. It portrays an economy in which interest rates slowly descend from the historically high rates registered in the last few years. Given this, we anticipate that in 1985 and 1986, there will be a deceleration from the extraordinarily strong economic performance registered in the United States and Canada in 1984. Following this growth "pause", the case anticipates another three-year acceleration of growth before slow growth again emerges in 1990. As measured by Real GNP, growth averages 2.8 per cent annually in 1985-90.

It should be noted that the outlook anticipates that the modest increases in government claims on economic resources that have emerged in the last few years will be continued into the future. The particularly slow growth of government capital spending in the near term reflects the winding down of the federal government's Special Recovery Capital Progam. The outlook anticipates notable growth of

business investment in the first two years, but the mid-decade pause in growth is projected to slow this recovery in 1987.

Given this growth profile, the outlook projects annual increases in employment of 1.3 per cent (or, about 160,000 each year). The labour force can also be expected to grow, however, so that this growth yields only a slow decay in the country's currently high unemployment rate. It will be noted that the slow growth of government spending is reflected in modest increases of employment by governments. Moreover, the near-term stagnation in government capital expenditures and later slow growth in business investment will limit the growth of employment in the construction industry.

Table 4

Base Case Economy

	1985	1986	1987	1988	1989	1990
Annual percentage Change						
Real GNP	2.4	2.1	3.2	3.8	3.3	1.8
CPI	4.2	4.8	3.9	4.1	3.7	4.7
Government Expenditure						
Current	1.3	1.7	1.7	1.7	1.7	1.8
Capital	.4	-1.8	1.5	3.1	3.1	2.8
Employment	1.9	1.6	1.6	2.0	2.0	1.3
Construction	.5	-.1	-1.1	.7	1.2	.7
Government	-.1	.9	.9	1.4	1.5	1.7
Levels						
Unemployed (%)	11.0	10.8	10.6	10.1	9.6	9.8
Commercial Paper Rate	11.2	10.5	9.0	8.4	8.8	9.3

4 IMPACT RESULTS: HIGH AND LOW CASES

4.1 Impact On Expenditures And Output

As Figure 2 and Table 5 indicate, we anticipate positive effects on real Gross National Product (GNP) in all years of the impact. If there are no increases in user fees and property taxes, and if there is no significant effect on interest rates (the High

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Impact Case), the effect on GNP will be larger than the initial expenditure. If fees and taxes are increased, and there is an upward pressure on interest rates (the Low Impact Case), the impact on GNP over the full five years would be almost the same as the government expenditure program. In the High Impact Case, we would expect the program to increase the size of the real economy by up to three-quarters of one per cent, while in the Low Impact Case the increase would be about one-half per cent.

Figure 2

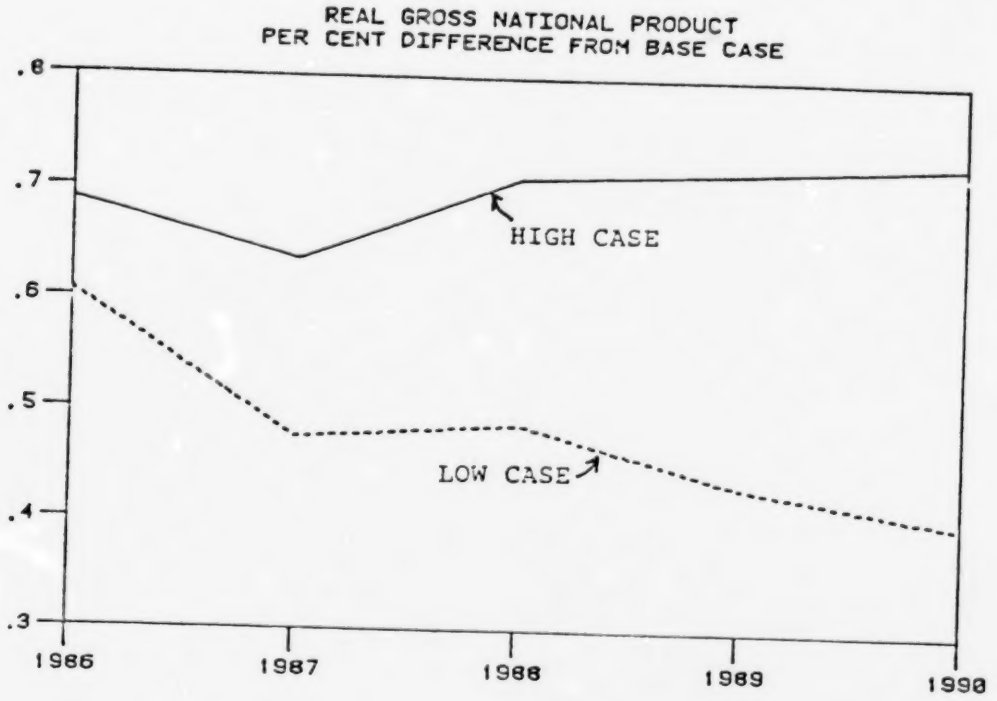

Table 5

Impact on Real Gross National Product
(in millions of 1971 dollars)

	1986	1987	1988	1989	1990	TOTAL
Spending Total	.74	.74	.74	.74	.74	3.69
Impact on GNP						
High Case	1.01	.96	1.12	1.12	1.20	5.47
Low Case	.89	.72	.77	.70	.66	3.75

As Tables 6 and 7 show, the positive effects on the components of Gross National Product are generalized for most years. Government capital expenditures are increased because they include the increased municipal expenditures. Beyond this, consumption expenditures would be increased by the impact of the spending program on real incomes of households. Personal incomes will be increased in the form of enlarged wages and distributed profits that result from the municipal spending. We anticipate that some of this additional income would be saved, but one-half or more will find its way into consumer spending. It may be noted that the additional consumer spending is slightly smaller in the case where governments impose user fees and property taxes, since these have the effect of limiting the improvement of real incomes.

Those industries that supply the labour, equipment and materials required to fulfill the municipal expenditures can be expected to increase their own investment to provide the enlarged facilities needed. If the spending program has no effect on interest rates, we anticipate that the impact on this part of "business investment" would be positive for all years. Furthermore, with improved incomes, households would reinforce this effect by spending more on their residences. If, however, there are upward pressures on interest rates (as in the Low Impact Case), then there would be an offsetting negative impact on investment generally. As Table 7 details, our results suggest that the net effects on business investment would approximately balance through 1989, but there would be lasting, negative effects thereafter.

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TABLE 6

HIGH IMPACT CASE

SUMMARY IMPACT TABLE
(PERCENTAGE DIFFERENCES)

	1986	1987	1988	1989	1990
GROSS NATIONAL EXPENDITURE:					
VALUE	0.76	0.42	0.89	0.99	1.41
PRICE	0.07	-0.21	0.18	0.27	0.68
VOLUME	0.69	0.63	0.71	0.72	0.73
VOLUMES:					
CONSUMPTION	0.13	0.45	0.31	0.39	0.24
DURABLES	0.13	0.67	0.29	0.43	0.14
OTHER	0.12	0.40	0.31	0.38	0.26
GOVERNMENT	2.43	2.55	2.56	2.60	2.60
CURRENT	-0.10	0.05	0.12	0.22	0.27
CAPITAL	17.77	17.65	17.10	16.63	16.15
BUSINESS INVESTMENT	0.16	0.36	0.61	0.61	0.53
RESIDENTIAL	0.27	-0.36	0.91	0.47	0.85
NON-RESIDENTIAL	0.13	0.54	0.53	0.65	0.46
CHANGE IN INVENTORIES (3)	188.27	122.52	-8.54	49.69	-11.58
NET EXPORTS	-5.15	-129.53	-18.88	-87.59	0.96
EXPORTS	0.08	0.02	0.11	0.11	0.17
IMPORTS	0.16	0.96	0.35	0.62	0.18
LABOUR MARKET:					
LABOUR FORCE	0.02	0.04	0.02	0.01	-0.01
EMPLOYMENT	0.28	0.41	0.51	0.58	0.62
UNEMPLOYED	-2.10	-3.06	-4.41	-5.33	-5.90
UNEMPLOYMENT RATE (1)	-0.23	-0.33	-0.45	-0.51	-0.57
WAGES AND PRICES:					
LABOUR INCOME/EMPLOYED	0.21	0.02	0.19	0.30	0.56
LABOUR PRODUCTIVITY	0.41	0.24	0.23	0.19	0.18
PRIVATE UNIT LABOUR COSTS	-0.27	-0.22	-0.06	0.12	0.39
IMPORT PRICE OF G & S	0.67	-0.14	0.87	0.85	1.66
IMPLICIT OUTPUT DEFLATOR	0.15	-0.13	0.28	0.36	0.79
CONSUMER PRICE INDEX	0.13	-0.18	0.18	0.24	0.61
INCOMES:					
DISPOSABLE INCOME/CAPITA	0.14	0.50	0.22	0.35	0.14
CORPORATE PROFITS	4.75	0.87	5.37	3.56	5.76
ALL-GOVERNMENT BALANCE (2)	-1127.16	-2224.58	-907.66	-1441.22	-273.59
FEDERAL (2)	164.16	-656.24	381.79	77.77	843.34
NON-FEDERAL (2)	-1291.84	-1569.02	-1289.56	-1517.94	-1116.92
CURRENT-ACCOUNT BALANCE (2)	-291.17	-1603.20	-722.42	-1278.89	-508.13
FINANCIAL:					
EXCHANGE RATE (US/CAN) (1)	-0.44	0.15	-0.58	-0.58	-1.18
PRIME COMMERCIAL PAPER RATE (1)	0.00	0.00	0.00	0.00	0.00
MONEY SUPPLY	0.66	0.30	0.76	0.84	1.25

(1) LEVEL DIFFERENCES
(2) LEVEL DIFFERENCES IN MILLIONS OF CURRENT DOLLARS
(3) LEVEL DIFFERENCES IN MILLIONS OF 1971 DOLLARS

TABLE 7

LOW IMPACT CASE

SUMMARY IMPACT TABLE
(PERCENTAGE DIFFERENCES)

	1986	1987	1988	1989	1990
GROSS NATIONAL EXPENDITURE:					
VALUE	0.87	0.58	1.14	1.31	1.82
PRICE	0.26	0.11	0.65	0.87	1.42
VOLUME	0.60	0.47	0.49	0.43	0.40
VOLUMES:					
CONSUMPTION	0.08	0.42	0.29	0.38	0.26
DURABLES	0.02	0.60	0.23	0.39	0.14
OTHER	0.10	0.39	0.30	0.38	0.28
GOVERNMENT	2.40	2.49	2.50	2.53	2.52
CURRENT	-0.14	0.02	0.08	0.18	0.23
CAPITAL	17.70	17.49	16.89	16.36	15.87
BUSINESS INVESTMENT	0.05	0.02	-0.03	-0.28	-0.53
RESIDENTIAL	0.01	-0.99	0.13	-0.50	-0.28
NON-RESIDENTIAL	0.06	0.28	-0.07	-0.23	-0.58
CHANGE IN INVENTORIES (3)	146.48	56.78	-79.67	-20.42	-71.63
NET EXPORTS	-5.70	-142.31	-28.50	-119.81	25.23
EXPORTS	0.05	-0.05	0.01	-0.04	-0.02
IMPORTS	0.14	0.99	0.36	0.66	0.28
LABOUR MARKET:					
LABOUR FORCE	0.00	0.01	-0.02	-0.03	-0.06
EMPLOYMENT	0.25	0.34	0.41	0.43	0.44
UNEMPLOYED	-2.13	-2.83	-3.87	-4.42	-4.74
UNEMPLOYMENT RATE (1)	-0.23	-0.30	-0.39	-0.42	-0.46
WAGES AND PRICES:					
LABOUR INCOME/EMPLOYED	0.32	0.25	0.52	0.74	1.11
LABOUR PRODUCTIVITY	0.36	0.15	0.13	0.06	0.04
PRIVATE UNIT LABOUR COSTS	-0.11	0.09	0.38	0.69	1.08
IMPORT PRICE OF G & S	0.67	-0.15	0.86	0.83	1.65
IMPLICIT OUTPUT DEFLATOR	0.24	0.10	0.66	0.90	1.46
CONSUMER PRICE INDEX	0.38	0.18	0.67	0.86	1.35
INCOMES:					
DISPOSABLE INCOME/CAPITA	0.03	0.43	0.15	0.28	0.09
CORPORATE PROFITS	4.59	0.58	5.13	3.73	6.77
ALL-GOVERNMENT BALANCE (2)	-611.66	-2016.70	-843.94	-1730.86	-1106.50
FEDERAL (2)	-378.42	-1572.44	-774.82	-1381.32	-939.13
NON-FEDERAL (2)	-233.17	-443.67	-70.81	-352.61	-167.67
CURRENT-ACCOUNT BALANCE (2)	-253.75	-1624.81	-695.50	-1271.80	-624.55
FINANCIAL:					
EXCHANGE RATE (US/CAN) (1)	-0.44	0.16	-0.58	-0.58	-1.18
PRIME COMMERCIAL PAPER RATE (1)	0.28	0.34	0.38	0.44	0.51
MONEY SUPPLY	0.18	-0.72	-0.69	-0.81	-0.52

(1) LEVEL DIFFERENCES
(2) LEVEL DIFFERENCES IN MILLIONS OF CURRENT DOLLARS
(3) LEVEL DIFFERENCES IN MILLIONS OF 1971 DOLLARS

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We estimate that only about ten per cent of the equipment and materials required to satisfy the needs of the municipal spending will be either directly or indirectly provided by imports. However, part of the increased spending by consumers and business will also be satisfied by imports, and in the Low Impact Case, where higher user fees, property taxes, and interest rates drive up Canadian prices, there is some loss of "competitiveness", which has the effect of increasing imports, and reducing exports. Finally, borrowing from foreigners to pay for increased imports of merchandise increases later interest and dividend payments to non-Canadian sources. Net of these several influences, we anticipate that these "leakages" from the positive effect of the spending program would be equivalent to about 30 per cent of the direct expenditures.

Since the direct expenditures of the municipalities are principally for purchases of equipment and construction labour, the main industrial benefits accrue to the construction and manufacturing sectors. As Table 8 shows, our results suggest that more than 55 per cent of the total change in economic output would be concentrated in these two industries combined. In the Low Impact Case, where there is a larger impact on inflation, the positive impact on manufacturing is dampened somewhat by the unfavourable effect of inflation on foreign trade and consumer purchases of durables.

Services sectors, which either provide inputs to manufacturing and construction, or increase in response to consumer and other induced expenditures, account for most of the rest of the industrial benefits. There are increases in the primary sectors (agriculture, fishery, forestry, and mining), but these constitute a small share of the total. It may be noted, however, that the increases experienced by these sectors, while a small share of the total impact, are, nevertheless, significantly above their Base Case levels.

Table 8

Industrial Impacts,
Total 1986-90
(in per cent)

	Share of Change to Total Economy		Change from Base Case	
	High Case	Low Case	High Case	Low Case
Agriculture	1.05	.97	.28	.19
Fisheries	.08	0.	.39	.11
Forestry	.75	.33	.67	.29
Mining	1.69	1.06	.47	.21
Manufacturing	27.91	19.84	.94	.49
Utilities	1.81	1.36	.36	.20
Construction	28.13	35.00	3.87	3.44
Transport, Storage Communications	10.20	9.29	.68	.45
Trade	8.79	8.38	.51	.35
Finance, Insurance Real Estate	8.54	12.19	.68	.69
Services	9.45	10.57	.34	.28
Housing	.18	-.36	.03	-.04
Public Admin.	1.79	1.42	.01	.10
Total	100.0	100.0	.73	.52

4.2 Impact On Employment

Our results suggest a total increase in employment for 1986-90 of 222,000 to 285,000 person years. Thus, even in the event of adverse effects on interest rates and application of user fees and increased taxes, we anticipate a notable increase in employment. As Figure 3 illustrates, we anticipate that the annual increases would range from about 30,000 in the first year of spending to between 50,000 and 75,000 in the last.

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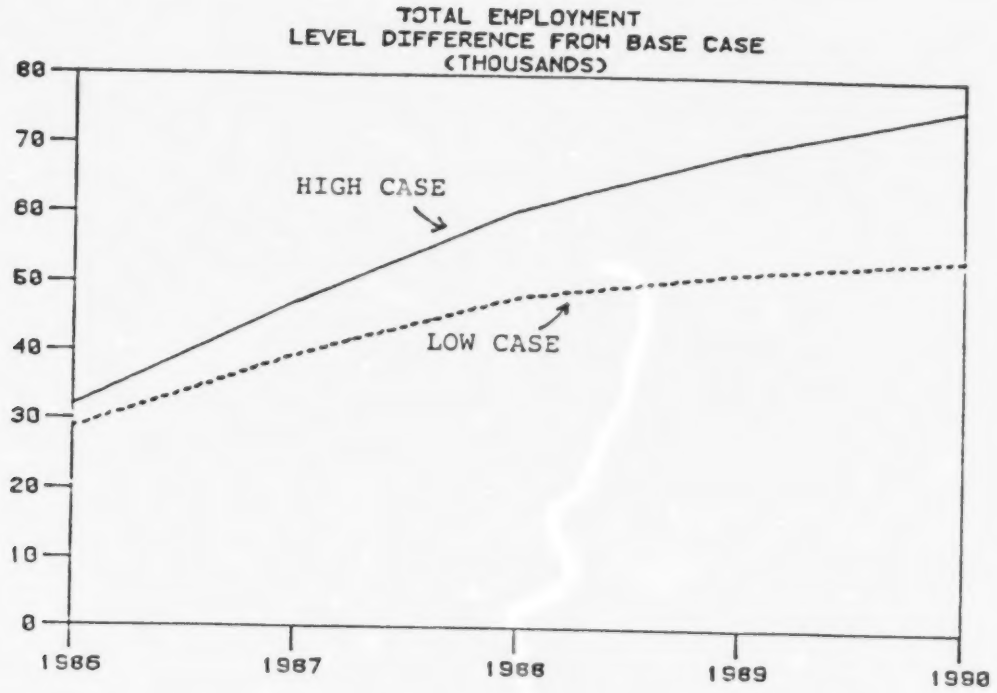
Figure 3



As is illustrated in Table 9, construction and manufacturing employment would constitute from 55 to 70 per cent of the increase in employment. The balance of the gains would be concentrated in services sectors, while gains in the primary sectors would likely be small.

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Table 9

Impact on Employment
(in thousands of person years)

	1986	1987	1988	1989	1990	TOTAL
Total						
High Case	32	47	61	69	76	285
Low Case	29	39	48	52	54	222
of which:						
Construction						
High Case	10	16	20	22	23	91
Low Case	10	15	19	20	20	84
Manufacturing						
High Case	8	11	15	18	21	73
Low Case	7	8	9	9	9	42

4.3 Impact On Inflation

Larger employment will provide part of the increased output anticipated. Part, however, will be accounted for by increased productivity. In turn, this and tighter labour markets account for increased wages. In the High Impact Case (Table 6), the increase in nominal wages lags that of the productivity gains initially so that unit labour costs initially decrease. A slight depreciation of the Canadian dollar in exchange markets, reflecting the negative influence of the spending program on the current account, provides an upward pressure on commodity prices. In later years, this pulls wage impacts above those of productivity, and unit labour costs are increased above those of the Base Case.

In the Low Impact Case, increased user fees, property taxes, and interest rates all have an inflationary effect on prices. This accelerates the inflationary process that follows from tightened labour markets and a depreciating dollar, and unit labour costs increase above those of the Base Case from the second impact year forward.

As is portrayed in Figure 4, the effect of these influences on the Consumer Price Index is more pronounced in the Low Impact Case. But it should be noted that the effect on the CPI is comparatively small in either event. In the High Impact Case, annual inflation is increased above that of the Base Case by 0.1 per cent; in the Low Impact Case, the increase amounts to 0.6 per cent.

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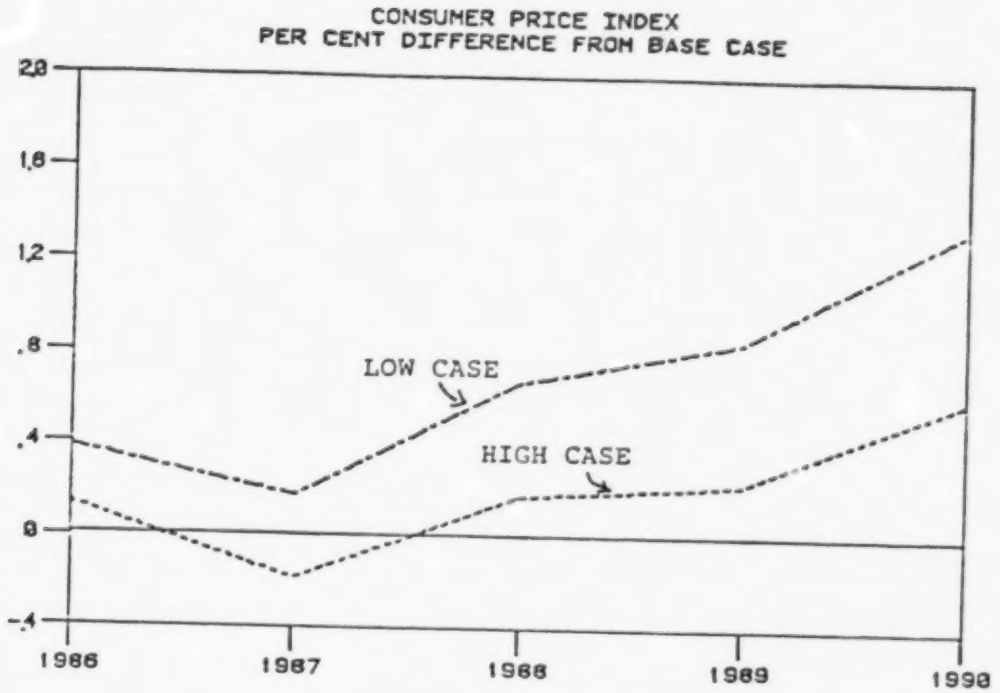
Figure 4



4.4 Impact On Incomes

We anticipate there would be positive impacts on real disposable incomes in both cases in all years. The increases would vary widely from year-to-year, but would range from an average $25 (at 1984 prices) in the Low Impact Case to $33 in the High Impact Case. Corporations could also expect to benefit; our results suggest increases in profits in the range of five per cent.

For governments, the effect on their treasuries is accounted for by the difference between increased revenues that accrue from improved economic activity (or, as in the Low Impact Case from increased user fees and property taxes), and increases in their respective expenditures for municipal infrastructure and their increased interest costs. These latter costs may rise either because of initial increases in deficits, or, as in the Low Impact Case, because of higher interest rates. For the federal government, changes in the unemployment insurance fund are also relevant.

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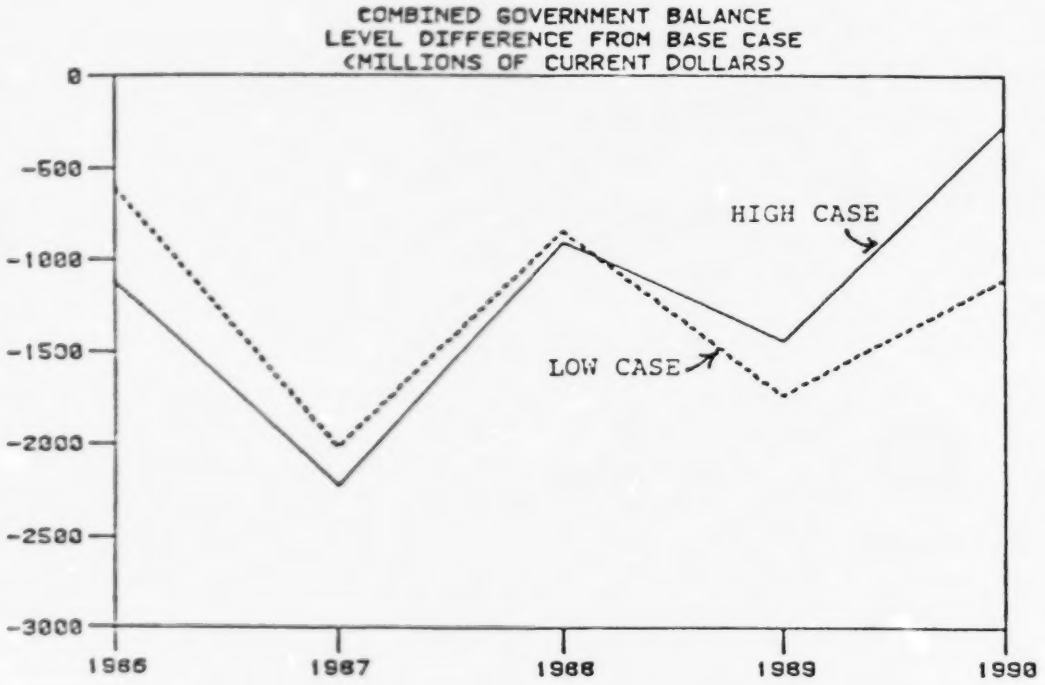
As shown below in Figure 5 and Table 10, our results suggest that the combined effect on all governments would be an increase in deficits of about $6 billion (in nominal dollars). As the spending program would cost more than $14 billion (at nominal prices), this implies that about $8 billion would be recovered from the initial expenditures through improved economic activity.

Figure 5



In the event that the whole program is funded through debt and there is no adverse effect on interest rates, we anticipate that the effects on federal and provincial balances would be positive, or only slightly negative. This reflects their sensitivity to an improved economic climate. In contrast, the deterioration in municipal balances would average more than $1 billion annually. In the event that municipalities fund most of their spending share through increased taxes and user fees, their balances would be positively affected. This, however, would weaken the general economic benefits of the program, and given high interest rates as well, would lead to deteriorating balances for the federal and provincial governments.

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Table 10

Impact on Government Balances
(in billions of nominal dollars)

	1986	1987	1988	1989	1990
High Impact Case					
Combined	-1.12	-2.22	-.91	-1.44	-.27
Federal	.16	-.66	.38	.08	.84
Provincial	-.37	-.59	-.12	-.22	.08
Municipal	-.94	-1.01	-1.22	-1.32	-1.20
Low Impact Case					
Combined	-.61	-2.02	-.84	-1.73	-1.11
Federal	-.38	-1.57	-.77	-1.38	-.94
Provincial	-.57	-.88	-.46	-.58	-.26
Municipal	.33	.40	.33	.19	.06

5 COMPARISON TO OTHER IMPACTS

While direct comparisons to alternative means of stimulating an economy that would otherwise be operating at less than full employment is difficult, other work we have undertaken suggests that capital spending by governments ranks high in increasing the size of the economy and creating new jobs.4/

This work is reflected in Table 11, which displays the effects on several measures of economic activity of changing taxes or expenditures by $2 billion (at 1984 prices) for each of five years. The "GNP Multiplier" measures the extent to which the total economy is altered per dollar of initial change in the tax or expenditure. Employment impacts, and the increase in the government deficit are accumulated over the full five years. In all instances, we have assumed that interest rates are unaffected by the initial policy change; this closely approximates the assumptions of the High Impact Case used in this study.

4/ Informetrica Limited, An Analysis of Selected Shocks to the Canadian Economy (Ottawa, Ont: Informetrica Limited, 1985), pp. 8-10

The "Increase in Government Capital Expenditures" is similar to the kind of expenditures assumed in this study. These results suggest a comparatively high expenditure multiplier (i.e., effect on the size of the economy), and employment effects for this kind of spending. And as can be discerned by comparing impacts on government treasuries, this is accomplished with a comparatively small impact on deficits. Policies that directly reduce Canadian prices are the only ones with a clear, comparative advantage over a program of increased capital expenditures.

Table 11

Comparison of Impacts of
$2 Billion Annual Shocks to Economy
(shocks in 1984 prices)

	GNP Multiplier	Employment Impact	Increased Government Deficit
	in year 5	cumulated thousands	cumulated billion $
Personal Tax Cut	.53	123	11.6
Corporate Tax Cut	.61	101	12.1
Government Expenditure Increase- Current	1.4	307	10.1
Government Expenditure Increase- Capital	1.42	270	8.5
Sales Tax Reduction	1.72	282	8.0

6 QUALIFICATIONS TO ASSUMPTIONS AND RESULTS

Three qualifications to the assumptions we have made, or to the detail of the results, are worth noting. None of these, however, would significantly alter the general character of our findings.

1. Our assumption that an incremental spending program would be evenly distributed over five years, beginning in 1986, is essentially arbitrary. It does recognize, however, that some time will be needed to gather support for and to implement the program, and that other factors may cause the program to be stretched out over a period of years. If the expenditures in total are varied from those we have used, we anticipate that the economic results would be proportionately affected.

If there are substantial delays in the start-up of the program, the January, 1985, report indicates that the delay will further increase the real expenditures required to close the gap between existing facilities and "acceptable standards".5/

2. Commonsense suggests that a badly maintained public capital stock will have adverse effects on private productivity. A roadway full of holes has unfavourable effects on vehicles using it; the downstream pollution of a waterway by a municipality can adversely affect the health of citizens and limit the location of new industry seeking acceptable accommodation for its employees. As there is no empirical measure of the overall effect of these public sector limits on private productivity, we have not accounted for them. To the degree that they exist, however, our results understate the positive effects of the spending program. They would lower Canadian costs more than are reflected in these results, thereby improving the economy's "competitiveness" and increasing GNP, output, and employment through larger trade gains.

3. In the Low Impact Case, we have assumed that municipalities finance part of the expenditure increase through increased property taxes. It may be noted that the other tax sources available to the federal and provincial governments (personal and corporate taxes for example), could be substituted for those assumed in this study so long as transfer mechanisms between governments can be worked out. As well, it is possible that the federal and provincial governments might finance their increased expenditure shares through taxation. In this event, of course, the adverse effects on the interest rates reported in this study would be mitigated. Indeed, in all of these alternative instances, there would be different effects on industries but the aggregate results reported here would be insignificantly affected.

5/ We understand that the FCM intends undertaking work to assess the costs of such delays.